— BIODIESEL LOGIC INC —

BDL-55-PPS Batch Operating Sequence

Congratulations on joining the world of small scale Biodiesel Production; Take time to become intimately familiar with every aspect and feature of your new processor, find the location of each tagged valve and each one of the process buttons and switches. Each one of them plays an important part in the proper operation and function of the processor. If you feel comfortable with the location of all of the valves, buttons and switches it is time to proceed with making your first batch of Biodiesel.

1. Place valve V-1 in the React position

2. Open valve V-2 and fill the Processor with proper, conditioned and de-watered feedstock to the 209 liter level

3. Close valve V-2

4. If three position selector switch is not already in the "A" or Pre-heat position turn it to the "A" or Pre-heat position now.

5. Press the Pre-heat button; This will enable the process to gently preheat the feedstock to 140 degrees F and maintain it at that temperature until you are ready to proceed to the next step

6. Once the feedstock has reached temperature it is time to move on to the React phase of the process; Turn the three position selector switch to the "B" or react position

7. Press and hold the Glycerin Drain button for 60 full seconds; this operation insures that you have true clean conditioned feedstock available in the suction manifold to draw a sample from

8. Turn the three position selector switch back to the "A" or Pre-heat position and press the Preheat button to re-engage the Preheat cycle to maintain the feedstock temperature

9. Open valve V-3 slowly and draw aprox 400 milliliters of feedstock for a sample to titrate. Close valve V-3

10. Titrate feedstock to determine the amount of KOH or NAOH to add to the methanol to generate the reaction process (see appendix A)

11. Place valve V-4 in the Fill position

12. Open valve V-5 and adjust (if necessary) to establish air pump stroke rate of 2 strokes per second (note the maximum pumping rate is 2 strokes per second per

pump manufacture) fill methyl/oxide mixer drum to the indicated 11 gallon mark

13. Close valve V-5

14. Weigh out KOH or NAOH as dictated by titration

15. Remove the vent plug from the methyl/oxide Mixer drum and using a wide mouth funnel pour in the prescribed amount of KOH or NAOH

16. Replace the vent plug; Note at all times when handling potentially dangerous chemicals such as methanol, KOH or NAOH it is recommended that safety precautions such as wearing protective gloves and a respirator be a matter of normal operation.

17. Turn the three position selector switch to the "B" or React position

18. Press the Mixer button; The Mixer runs for 3 minutes

19. After the Mixer times out move valve V-4 to the Inject position

20. Press the React button

21. open valve V-5 then valve V-6 in that order and in quick succession to inject the methyl/oxide into the process pump suction stream

22. Adjust the regulator to establish a air pump stroke rate of 2 strokes per second (note the maximum pumping rate is 2 strokes per second per pump manufacture)

23. When all of the methyl/oxide has been injected into the feedstock close valve V-6 and move valve V-4 back to the fill position in that order and in quick succession, this will allow the air pump to be purged with clean methanol allow air pump to run until you have pumped aprox one gallon of clean methanol into the methyl/oxide mixer drum (secure the bulk methanol drum and move it away from the processor)

24. The process pump will continue to run for aprox 1 ½ hours and will then time out; at this point the glycerin will begin to fall out of the raw biodiesel. The amount of time it will take for all of the glycerin to fall out of the raw biodiesel will vary from batch but should take at least 1 ½ to 2 hours to complete

25. When you are reasonably sure all of the glycerin has fallen move valve V-7 from Process to Glycerin

26. Press and hold the Glycerin button to pump out the glycerin to a suitable container (note you will have at a minimum 11 gallons to 12 gallons of glycerin to remove from the reactor) when you see the color phase change at the glycerin hose discharge release the Glycerin Drain button and move valve V-7 back to the Process position (secure the glycerin container and move it away from the processor)

27. Move valve V-1 to the Dry Wash position

28. Turn the three way selector switch to the "C" or Dry Wash position

29. Press the Dry Wash button; After about two minutes check the pressure gage on the methanol recovery heater the proper flow rate is 1 ½ lbs to 2 lbs although in the beginning of the Dry Wash cycle you may see pressures in excess of 3 lbs it will begin to fall as soon as negative pressure is developed inside the reactor. The pressure can be regulated by slowly moving valve V-8 handle either toward the open or closed position in very small increments. Open the water valve to establish cooling water flow through the methanol recovery condenser. The Dry Wash cycle will take aprox 3 hours more or less to complete do not get alarmed if the methanol recovery temperature does not climb to operating temperature immediately it will climb to operating temperature when there is available methanol to recover which may be in the second half of the batch.

31. After the Dry Wash cycle has ended it is advisable that you leave the finished biodiesel in the integrated storage tank until it has cooled to ambient temperature his will help to prevent the propagation of moisture in the fuel by exposing it to sudden cooling in the process of pumping and going into a cool vessel for final storage

32. Your processor is now ready to start your next batch of Biodiesel

33. After the finished Biodiesel has cooled turn on the Fuel Transfer switch to transfer the fuel to final storage